Regulatory Guide Periodic Review

Regulatory Guide Number:	**5.34**
Revision:	**1**
Title:	**Nondestructive Assay for Plutonium in Scrap Material by Spontaneous Fission Detection (May 1984)**
Office/division/branch:	**NMSS/FCSE/MCAB**
Technical Lead:	**Tom Pham**
Recommended Staff Action:	**Reviewed with issues identified for future consideration**

1. What are the known technical or regulatory issues with the current version of the Regulatory Guide (RG)?

This RG was issued in May 1984 to describe methods acceptable for the use of nondestructive assay (NDA) techniques in the measurement of bulk plutonium scrap material. These methods are used to establish and maintain a system of control and accountability to ensure that the standard error of inventory difference (SEID) ascertained as a result of a measured material balance met established minimum standards, as required by 10 CFR 70.51, "Material Balance, Inventory, and Records Requirements."

In 2002, the NRC revised 10 CFR Part 74, “Material Control and Accounting of Special Nuclear Material,” and the requirements in 10 CFR Part 70.51 were transferred to 10 CFR Part 74. Specifically, the NRC revised 10 CFR Part 74.31, “Nuclear material control and accounting for special nuclear material of low strategic significance,” 10 CFR Part 74.41, “Nuclear material control and accounting for special nuclear material of moderate strategic significance,” and 10 CFR Part 74.51, “Nuclear material control and accounting for strategic special nuclear material.” As a result, RG 5.34 is not cross-referencing to the correct regulatory citations.

In addition, the guide references the American National Standards Institute (ANSI) Standard N15.20 1975, "Guide to Calibrating Nondestructive Assay Systems," which has been withdrawn with no replacement. A number of American Society for Testing and Materials (ASTM) standards are currently available such as ASTM C1207-10, “Standard Method for Nondestructive Assay of Plutonium in Scrap and Waste by Passive Neutron Coincidence Counting,” which is still active. Also, although dating to the 1970s, it should be noted that the 13 references that were listed in the guide are still available using a web search on the internet.

2. What is the impact on internal and external stakeholders of not updating the RG for the known issues, in terms of anticipated numbers of licensing and inspection activities over the next several years?

Current licensees routinely implement measurement systems and measurement methods for all SNM, including the determination of plutonium in scrap and waste materials. Additionally, current material control and accounting (MC&A) guidance in NUREG documents (e.g., NUREG-1280, "Acceptable Standard Format and Content for the Material Control and Accounting Plan Required for Strategic Special Nuclear Material," for Category I, "High Enriched Uranium" fuel cycle facilities, and NUREG-1065, "Acceptable Standard Format and Content for the Material Control and Accounting Plan Required for Special Nuclear Material of Low Strategic Significance," for Category III, "Low Enriched Uranium," fuel cycle facilities) include detailed discussions of measurement systems and measurement methods.

The staff is not expecting any new applications for the next 2-3 years where this RG could be used and therefore, is not affecting the licensing and inspection activities. However, during the next review the staff should review the most current technology and standards available that could be endorsed in the revised guide.

3. What is an estimate of the level of effort needed to address identified issues in terms of full-time equivalent (FTE) and contractor resources?

An estimate of the effort needed to correct the identified issues is between 0.10 full-time equivalent (FTE) and 0.20 FTE. No contractor support is anticipated.

4. Based on the answers to the questions above, what is the staff action for this guide (Reviewed with no issues identified, Reviewed with issues identified for future consideration, Revise, or Withdraw)?

Reviewed with issues identified for future consideration.

5. Provide a conceptual plan and timeframe to address the issues identified during the review.

As discussed in Management Directive (MD) 6.6, "Regulatory Guides," the NRC staff reviews RGs approximately every 5 years to ensure that these guides continue to provide useful guidance. The staff will consider the regulatory citation issues and any other technical information that may need to be updated during the next periodic review of the guide.

This RG could possibly be combined with RG 5.11, "Nondestructive Assay of Special Nuclear Material Contained in Scrap and Waste," to address different NDA methods for scrap and waste nuclear materials.

NOTE: This review was conducted in August 2016, and reflects the staff's plans as of that date. These plans are tentative and subject to change.